

CLAIMS

We claim:

1. A heat-seal polymer film comprising a layer of film formed from a metallocene-catalyzed isotactic random copolymer of propylene and at least one other C₂ to C₈ alpha olefin.
2. The heat-seal polymer film of claim 1, wherein the at least one other C₂ to C₈ alpha olefin is present in the random copolymer in an amount of from about 0.5 % to about 30 % by weight.
3. The heat-seal polymer film of claim 1, wherein the at least one other C₂ to C₈ alpha olefin is present in the random copolymer in an amount of from about 1% to about 15% by weight.
4. The heat-seal polymer film of claim 1, wherein the film has a seal initiation temperature of from about 80°C to about 125°C defined at a seal strength of 200 g/inch.
5. The heat-seal polymer film of claim 1, wherein the random copolymer has a DSC melting point temperature of less than about 150°C.
6. The heat-seal polymer film of claim 1, wherein the film has less than 3% haze.
7. The heat-seal polymer film of claim 1, wherein the film has greater than 85% gloss at a 45° incident angle.
8. The heat-seal polymer film of claim 1, wherein the random copolymer has a xylene solubles content of less than 5% by weight.
9. The heat-seal polymer film of claim 1, wherein the layer of film is a cast film.

10. The heat-seal polymer film of claim 1, wherein the layer of film is an oriented film.
11. The heat-seal polymer film of claim 1, wherein the at least one other C₂ to C₈ alpha olefin is ethylene.
12. The heat-seal polymer film of claim 1, wherein the random copolymer is a random terpolymer and the at least one other C₂ to C₈ alpha olefin is ethylene and butene.
13. The heat-seal polymer film of claim 1, wherein the at least one other C₂ to C₈ alpha olefin is butene.
14. The heat-seal polymer film of claim 1, wherein the heat-seal film has an ultimate seal strength that is at least 30% greater than a heat-seal film prepared under similar conditions from a Ziegler-Natta-catalyzed isotactic random copolymer of propylene and the at least one other C₂ to C₈ alpha olefin.
15. The heat-seal polymer film of claim 1, wherein the heat-seal film is a cast film and provides a hot-tack seal strength above 0.4 N/cm at a temperature range of from 60°C to 130°C.
16. A multi-layer polymer film comprising a polyolefin core layer and at least one heat-seal layer formed from a metallocene-catalyzed isotactic random copolymer of propylene and at least one other C₂ to C₈ alpha olefin that is joined to the polyolefin core layer.
17. The multi-layer polymer film of claim 16, wherein the core layer and heat-seal layer are coextruded together.

18. The multi-layer polymer film of claim 16, wherein the heat-seal layer has a thickness that is less than the thickness of the core layer.
19. The multi-layer polymer film of claim 16, wherein the heat-seal layer has a thickness that is 20% or less than the thickness of the core layer.
20. The multi-layer polymer film of claim 16, wherein the at least one other C₂ to C₈ alpha olefin is present in the random copolymer in an amount from about 0.5 % to about 30% by weight.
21. The multi-layer polymer film of claim 16, wherein the at least one other C₂ to C₈ alpha olefin is present in the random copolymer in an amount from about 1% to about 15% by weight.
22. The multi-layer polymer film of claim 16, wherein the heat-seal layer has a seal initiation temperature of from about 80°C to about 125°C defined at a seal strength of 200 g/inch.
23. The multi-layer polymer film of claim 16, wherein the random copolymer of the heat-seal layer has a DSC melting point temperature of less than about 150°C.
24. The multi-layer polymer film of claim 16, wherein the heat-seal layer provides an ultimate seal strength that is at least 30% greater than a heat-seal layer prepared under similar conditions from a Ziegler-Natta-catalyzed isotactic random copolymer of propylene and the at least one other C₂ to C₈ alpha olefin.
25. The multi-layer polymer film of claim 16, wherein the at least one other C₂ to C₈ alpha olefin is ethylene.
26. The multi-layer polymer film of claim 16, wherein the random copolymer is a random terpolymer and the at least one other C₂ to C₈ alpha olefin is ethylene and butene.

27. The multi-layer polymer film of claim 16, wherein the at least one other C₂ to C₈ alpha olefin is butene.
28. The multi-layer polymer film of claim 16, wherein the heat-seal layer is a cast film layer and provides a hot-tack seal strength above 0.4 N/cm at a temperature range of from 60°C to 130°C.
29. A material for use in heat-seal applications comprising a metallocene-catalyzed isotactic random copolymer of propylene and at least one other C₂ to C₈ alpha olefin.
30. The material of claim 29, wherein the material provides a heat-seal film having an ultimate seal strength that is at least 30% greater than a heat-seal film prepared under similar conditions from a Ziegler-Natta-catalyzed isotactic random copolymer of propylene and the at least one other C₂ to C₈ alpha olefin.
31. The material of claim 29, wherein the at least one other C₂ to C₈ alpha olefin is present in the random copolymer in an amount of from about 0.5 % to about 30 % by weight.
32. The material of claim 29, wherein the at least one other C₂ to C₈ alpha olefin is present in the random copolymer in an amount of from about 1% to about 15% by weight.
33. The material of claim 29, wherein the material provides a heat-seal film having a seal initiation temperature of from about 80°C to about 125°C defined at a seal strength of 200 g/inch.
34. The material of claim 29, wherein the random copolymer has a DSC melting point temperature of less than about 150°C.

35. The material of claim 29, wherein the material provides a heat-seal film having less than 3% haze.

36. The material of claim 29, wherein the material provides a heat-seal film having greater than 85% gloss at a 45° incident angle.

37. The material of claim 29, wherein the random copolymer has a xylene solubles content of less than 5% by weight.

38. The material of claim 29, wherein the at least one other C₂ to C₈ alpha olefin is ethylene.

39. The material of claim 29, wherein the random copolymer is a random terpolymer and the at least one other C₂ to C₈ alpha olefin is ethylene and butene.

40. The material of claim 29, wherein the at least one other C₂ to C₈ alpha olefin is butene.

41. The material of claim 29, wherein the material provides a cast heat-seal film having a hot-tack seal strength above 0.4 N/cm at a temperature range of from 60°C to 130°C.

42. A method of forming a heat-seal film comprising:

providing a metallocene-catalyzed isotactic random copolymer of propylene and at least one other C₂ to C₈ alpha olefin; and

forming the random copolymer into a layer of film.